Child Passenger Safety TECH REPORT

Universal Anchor Standard for Child Restraints Issued

The U.S. is the first country to adopt a requirement for universal, uniform anchor systems for child restraints, after eight years of development at the international level and in this country. The new standard was published in early March, 1999. It includes FMVSS 225, Child Restraint Anchorage Systems (which focuses on vehicle requirements), and amendments to FMVSS 213, Child Restraint Systems. The first effects of this change will be seen starting September 1999.

The universal anchor rule will provide devices independent of safety belts to attach child restraints (CRs) to the vehicle. It will allow child restraints to be anchored more securely than is often possible with current safety belts. Having separate CR anchors will allow safety belts to be designed for the large child and adult without the necessity of also serving as effective anchors for CRs.

The new anchor system consists of three points of attachment (see pictures):

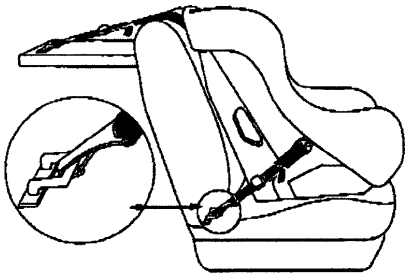
- **Two small bars** (lower anchors or LAs) behind the seat bight (intersection of upper and lower cushions) to which two special hooks on the lower frame of the child restraint are attached. The hooks may be on straps attached to the restraint or part of the CR frame itself.
- **One tether anchor** (TA) behind the seating position to which a tether strap from the top of the child restraint is hooked.

The universal anchors will be required in only a limited number of seating positions in a vehicle. It is being called UCSSS (universal child safety seat system).

The tether anchor system will be required this fall, with lower anchors being phased in over several years. This is because more change will be required to accomplish the latter.

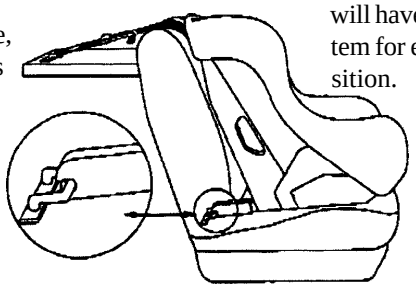
Tethers to appear this year

Starting September 1, 1999, all forward-facing child restraints sold in the U.S. will be required to meet a stricter test for head excursion, 3-1/2 inches less than the current standard. Most, if not all manufacturers are expected to meet through the use of a tether. The new head excursion limit is the same as that required under the current Canadian rule. In addition, CRs will have to meet the current head excursion limit without the tether attached. This will assure a minimum level of protection if the tether is not used. Tether requirements do not extend to CRs used in the rear-facing position.



A *Universal anchor with tether and strap/hook attachment on restraint*

As of the same date, most new passenger cars (those for the 2000 model year) will have user-ready, factory-installed tether anchors (TAs). Light trucks, including vans and sport utility vehicles, also must provide tether anchors by September 2000.



B *Universal anchor with tether and rigid latch on restraint*

Lower anchors to have longer phase-in period

The phase-in period for the child restraint lower anchors (LAs) will begin in the model year 2001 (September 1, 2000) and continue for two years. At the end of that phase-in period, September 1, 2002, all new vehicles will have such anchors in at least two seating positions (if they have a rear seat). Vehicles with only a front seat will have LAs and TAs in passenger seats if they have an air bag shut-off switch.

Child restraints manufactured on or after September 1, 2002 will be required to have LA attachment devices. By that date, there will have been two model years of vehicles equipped with lower anchors, which will facilitate the transition. CRs also will continue to have belt paths for installation in older vehicles that do not have universal anchors. The belt path also is needed for installation in aircraft.

Where will universal anchors be installed?

Vehicles will be required to have complete universal anchorages in two seating positions. Most passenger vehicles are likely to have them located in the second row-outboard positions because of the difficulty of fitting two adjacent universal anchorages (in a side and center position).

- Vehicles with at least three rear seating positions must have an additional center seating position with a tether anchor to improve installation in the position favored by many parents.
- In vehicles with three or more rows of seats, there must be at least one universal anchorage in the second row.
- Vehicles without a rear seat will have a universal anchor system for each front passenger position.
- Convertibles and large school buses are exempt from the tether requirements due to the impracticalities of installing them. Small school buses (under 10,000 lbs) that now are required to have lap belts will be required to have two universal anchors installed.

What will tether anchor brackets look like?

They will not necessarily look like the anchor bracket used for the add-on anchors. Some are expected to be short straight or U-shaped bars and many will be hidden under covers. If under a cover, the cover may be marked by a logo, which is required for Canadian vehicles. They must be readily accessible with either a screwdriver or a coin.

Editor's Note: If you'd like to see the future today, visit a Volkswagen dealership. VW has taken an early lead by providing LAs in the 1998-99 Golf and universal anchors in the new '99 Beetle.

Ask the Industry Experts

This Lifesavers 17 session included child restraint experts from the major U.S. auto companies and child restraint manufacturers. Here are some of the questions posed to them and their answers:

■ **Can belt webbing be twisted to shorten the non-adjustable end?** Indiana Mills has tested twisted belts dynamically, after soaking them in apple juice and cola. While the belt webbing lost some strength (after 2 twists, 11% degradation of strength; after 6 twists, 40%), the overall effect was not enough to affect child restraint use. Safety belts are built to withstand at least 6000 lb. force. A CR would normally put about 2000 lb. of force on the belt, equalling 1000 lb. on each lap belt anchor. Despite this, some manufacturers recommend no more than two twists.

■ **Can center-rear shoulder belts be retrofitted?** The center-rear shoulder belt anchorage must be designed into the vehicle. There is no way to add a shoulder belt in the center of most current models.

■ **Shoulder belt retrofit kits:** Model-specific kits, such as those from Ford, usually have tear-stitching or other means of preventing submarining that can occur if the shoulder belt is too snug. If an aftermarket shoulder belt has been installed, the user should adjust it with a little slack in the shoulder belt. A fist-width of slack is sufficient. (Ford and Chrysler shoulder belt kits are posted on the website: *www.childsafety.org*.)

■ **Dealer installation of retrofit shoulder belt kits or tether kits:** The dealers are indemnified by the manufacturers for the kits made specifically for the vehicles they carry. If the dealer personnel install them according to directions, they would not be liable for damages.

■ **How critical is the upper weight limit on belt-positioning boosters?** Height is the most critical factor, but weight must be considered.

■ **Infant foot space:** Some CR manufacturers are relaxing their prohibition on infants' feet touching the vehicle seatback since no problem has been found.

■ **Rear-facing limits:** Cosco has added "rear-facing to one year of age" to its instructions. However, Century combination toddler/booster seats still use a minimum weight and developmental criteria ("can sit up alone") rather than an age criterion. Note: in Canada the rear-facing maximum is still 20 pounds. This is expected to be changed, but it will take at least a year.

■ **Cinching latchplates that slip:** A representative of DiamlerChrysler stated that the cinching latchplate is designed to meet the federal lockability standard. If it slips, a locking clip can be added. The problem with heavier, bulkier, and more slip-proof locking latchplates is that they keep the belt from retracting when unlatched, so the belt tends to get caught in the door.

■ **Non-skid mats:** Can a mat be added under a CR to keep it in place on a slippery vinyl or leather seat cushion? A thick mat should not be added and no mat will keep the seat in place in a crash. However, adding a thin mat, especially under a belt-positioning booster that has a wide, flat base, is acceptable.

Tech Tips

Graco Quest

What is the new Graco "Quest"? It is a combination toddler-booster seat, the same as the Century Breverra Contour. Graco now owns Century Products.

Replacement Rear Buckle for Some GM Vehicles

Some customers have found excessive side-to-side movement when using some child restraints in the second- and third-row bucket seats of the following 1997-99 vehicles:

- Chevrolet Venture
- Oldsmobile Silhouette
- Pontiac Trans Sport

General Motors will provide a replacement rear seat belt buckle, part number 12516351. From General Motors Service Bulletin No. 83-16-07, October 1998.

Obtaining GM Tether Kits

If consumers have trouble obtaining tether kits from GM dealers or consumer information services, they can contact Ken Stack, GM Safety Office, at 810/947-1766.

New Vehicle Safety Features for Kids

New technology is being introduced into the fleet rapidly but unevenly. Back seat features are installed voluntarily by vehicle manufacturers. New features tend to be introduced first in the more expensive vehicles.

Features in the back seats of 1999 vehicles that can improve children's safety include:

- Adjustable upper shoulder belt anchorages
- Rear seat head restraints, standard in almost all sport utilities and in most vans and heavy passenger cars
- Center rear lap/shoulder belts, most common in larger passenger cars (although by no means universal) but rare in sport utility vehicles
- Built-in child restraints, optional in a number of vans and in a few passenger cars, none in sport utilities
- Air bag shut-off switches are now standard in light trucks and cars that have no back seat
- Devices to open rear trunk latchs from the inside are beginning to appear in sedans

NHTSA has produced two pamphlets that list the features of various new car models. To obtain copies of "New Car Safety Features" and "Buying a Safer Car for Child Passengers," contact the Auto Safety Hotline (888-DASH-2-DOT) or your local AAA office.

For information on used as well as new vehicles, Safe Ride News subscribers can order the reproducible Fact Sheet, "Choosing a Vehicle for Family Safety," from SRN. Contact Jane at 206/364-5696 or send your fax number to *saferide@twbc.com* for an order form.

Terminology Note

A "child restraint" is a device that holds a child in place in the vehicle. A "booster seat" is not technically a child restraint, because it merely positions the child. The safety belt provides the restraint.

Side-impact Air Bags and Children

Side-impact air bags are an increasingly common new-vehicle front-seat safety feature or option. They are usually located in the door, door frame, or seat. Some are designed to protect the chest and others, the head. Side air bags are not regulated federally now. Luxury vehicles are most likely to have them. A few manufacturers, including Audi, BMW, and Mercedes, also offer them for rear seat passengers. Subaru and Chrysler are among those who are not offering side air bags at this time.

Crash Information

Side impacts accounted for 31% of passenger vehicle deaths in 1997, according to IIHS Fatality Facts. Deaths were evenly divided between the driver and passenger sides.

NHTSA has an ongoing crash investigation study of known side air bag deployments.* In the 27 cases investigated by April 1999, no serious injuries or fatalities have been attributed to the deployment of the side air bag. In two cases involving children, age 3 and 13, both were unrestrained and both sustained minor injuries due to the air bag cover flap. The younger child was in the front seat.

Other conclusions by NHTSA are that the side air bags have substantially reduced head injury. The deaths that have occurred were due to intrusion of the striking vehicle into the passenger compartment.

How do side air bags affect child safety?

At this point, correctly restrained child passengers, properly positioned in the vehicle, do not seem to be at risk of injury from them. However, some manufacturers think that a child who is unrestrained, or out of position could be injured. Some have produced "smart" side air bags that sense an occupant that is too close.

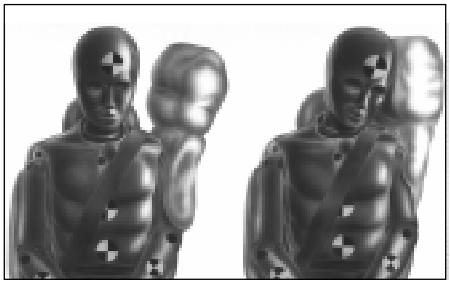
While parents are advised to transport children in the back seat, manufacturers must take into consideration that some children still ride in the front seat. Some children also ride unrestrained. Side air bags in rear seats pose a potential for injury to children riding there, particularly if unrestrained or out of position. Even children using lap/shoulder belts and booster seats may lean against the door and be at risk. The definition of "properly restrained" must include sitting upright, not against the door.

** Data from presentation by A. Chidester of NHTSA, April 19, 1999.*

The GM side air bag system in the front seat of its Chevy Venture passenger van senses when something is blocking the air bag's path and deploys with reduced force. The bags also are standard on GM's Oldsmobile and Pontiac minivans, as well as Cadillac Seville and Deville models, and an option on the Chevrolet Prizm.

Honda's advanced side air bag system, standard equipment on its 3.5RL Acuras, senses the weight, size, and position of a person in the front passenger seat. It can be deactivated if someone is leaning against the door, for instance.

BMW and Mercedes both have side-impact air bags that are mounted in the door panels. Mercedes also has introduced additional side protection with its window-bag, which deploys along the side windows like a curtain to provide head protection for both front and back-seat passengers.



Ford Taurus combination side air bag in the front seat cushions torso and head (illustration courtesy of Ford)

Side air bags for front passengers are standard on Lincoln vehicles, and offered by Ford on quite a few of its other models, including the 2000 Taurus (illustration). Ford uses a combination air bag. It deploys out of the side of the seat toward the door, parallel along the side of the seat, and then the two-sectioned cushion inflates to protect both the head and chest. A Ford spokesperson said the design was extensively tested, including out-of-position occupants and child dummies, but emphasized that the company still recommends to always put youngsters in the back seat.

Toyota provides seat-mounted side air bags as standard front-seat equipment on the Avalon, all Lexus sedans, and the RX 300 sport utility, and as an option on many others. "We specifically don't offer side air bags in rear seats because we want to maintain the rear seat as safest place for children, and air bags might compromise that," said a Toyota spokesperson.

Does a vehicle have a side air bag?

Finding out whether and where a vehicle has side air bags can be a challenge. The most common locations are just above the armrests in the front door panels, along the side of the seat back, or at the base of the seat near the seat adjustment levers. Sometimes there is even a compartment above the window, along the roofline. The compartments are usually stamped or labeled "SRS airbag," but not in a contrasting color. There may also be a notice on the side of the door jamb. Toyota, for one, places stickers the side window as well. The owner's manual is a useful reference.

The bottom line

More research and crash data are needed. NHTSA has urged automakers to test side air bags with child-size (and adult) crash dummies in various positions,. The agency also is asking emergency assistance personnel to notify it when side air bags have deployed in a crash. Meanwhile, the increasing variety of air bag designs and locations makes it more important than ever to keep all children of all ages properly positioned within the car, as well as properly restrained.

—Gisela Moriarty

Contacts:
IIHS, 703/247-1500, *www.highwaysafety.org*.
NHTSA 1-800/DASH-2-DOT, *www.nhtsa.dot.gov*.

Emergency Rescue Personnel: To notify NHTSA of a side air bag crash, call: Special Crash Investigation Hotline, 202/493-0400, or fax to 202/366-5374, or e-mail, *airbag.crash@nhtsa.dot.gov.*

Certification Notes

National CPS Board Organized

The national board for the child passenger safety training and certification program held its first meeting March 8-9, 1999. The purpose of the board is to provide overall technical, policy, and program direction and to maintain the national curriculum, test, and standards for implementation.

Members of the board

Chair: Steve Anderson, USAA
Mariela Alarcon, National Council of La Raza
Barbara Foley, Emergency Nurses Assn.
Carole S. Guzzetta, National Safety Co.
William Hall, University of North Carolina Highway Safety Research Ctr.
Lisa Hershey, California Dept. of Health Services
Randy Kiser, Evenflo
Kathy Kruger, Safety Restraint Coalition
Nancy Lang, Safety Consultant
Laura Ludwig, Nat. Assn. of Governors' Highway Safety Representatives
Lori Miller, NHTSA
Mark Miller, US Public Health Service
Allison Rand, American Academy of Pediatrics
Robert Rowe, Internat'l Assoc. of Chiefs of Police
Camilla Taft, National SAFE KIDS Campaign
Lorrie Walker, American Academy of Pediatrics, Pennsylvania Chapter
William Wen, Am. Automobile Assn.
Vehicle Manufacturer (to be decided)

Some members were selected because of their roles as seasoned trainers. Others have experience in public health, the functioning of certification programs, or are representing groups of major stakeholders in the process. The board will be coordinated through the National Safety Council (NSC), with Carole Guzzetta of NSC as coordinator and board secretary.

Steve Anderson of USAA was elected chairperson. At the Lifesavers conference in March, Anderson emphasized that the recertification effort must maintain standards and be documentable, cost effective, and convenient.

Several committees were formed, including By-laws, Certification, Curriculum, Re-certification, and Communications. A task force to monitor training quality.

The Certification Committee, headed by Lorrie Walker, plans to modify, create, or improve the forms and the process used in certification.

The Curriculum Committee, headed by Nancy Lang, met in April to begin revising and updating the curriculum. It is slated to be completed during the summer.

The Re-certification Committee, under Bill Wen, has developed an interim process and will have a formal process in place by January 2000.

The Communications Committee, chaired by Carole Guzzetta, has begun a process of improving communications among the various stakeholders.

To communicate with the board, contact the coordinator, Carole Guzzetta of NSC, at 202-296-6263 or (e-mail) *guzzetc@nsc.org*.

Communicating with AAA

Bill Wen is the manager of Training and Professional Development at AAA, which administers the certification process, The address is: AAA, Traffic Safety Department - Mail Stop 76, 1000 AAA Drive, Heathrow, FL 32746-5063. Bill can be reached at: 407/444-7960 or via e-mail: *wwen@national.aaa.com*

Jennifer Huebner handles the logistics and paperwork for the certification program at AAA. You can contact her at 407/444-7912 or *jhuebner@national.aaa.com*.

Interim Re-certification Plan

The 1999 plan includes a packet of updated information sent to each technician or instructor, documentation during the year of hands-on checks of all types of child restraints signed off by an instructor, and satisfactory completion of a take-home written test.

In addition to meeting the requirements for technician re-certification, technician-instructors would also have to review instructional techniques, provide class rosters and associated materials for all classes taught, and provide class agendas with instructor assignments indicated.

In summary, the re-certification process for 1999 will be:

1. Review the printed literature included in the re-certification package.
2. Complete the hands-on documentation.
3. Complete a new agreement form.
4. Successfully complete and return the written test.
5. Send in the requested materials and $10.00 fee to AAA.

TECH Report Available Online

The four-page technical report in *Safe Ride News*, starting in the Winter 1998-99 issue, is also available on the NHTSA web site. This material is paid for by NHTSA and is also to be distributed to all technicians and instructors who are not subscribers to SRN. Find the list at: *http://www.nhtsa.dot.gov/people/injury/childps.*

States Designate CPS Training Coordinators

Each state has selected a person to be the coordinator of CPS training. Please contact the person listed below in your state for information about training and child passenger safety networking activities. Also, please inform them of your activities in child passenger safety. Find the list at: *www.nhtsa.dot.gov/people/injury/childps/training.*

Baby Saved in 80-mph Crash

A 5-month old baby in Michigan was saved by her car seat in a very severe frontal crash. The father fell asleep at the wheel and drove off the freeway, reportedly at nearly 80 mph. The vehicle hit a large tree. The father was killed instantly.

Mom and baby were in the back seat. Mom was sleeping (slouching) in her lap/shoulder belt. She survived with serious abdominal injuries. The baby, riding rear-facing in an infant restraint (buckled in without its base) was virtually uninjured. The latchplate of the car seat buckle was bent so severely that it was hard to get the baby out.

From CPS E-mail List message, 5/13/99